REMARKS

By this Amendment, claims 1 and 13 are amended. Support for the amendments to claims 1 and 13 may be found, for example, in paragraph [0050] of the detailed description. No new matter is added. Accordingly, after entry of this Amendment, claims 1 and 2-14 will remain pending in the patent application. Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. §1.116 as the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not present any new issues that would require further consideration and/or search as the amendments merely amplify issues discussed throughout the prosecution; (c) do not present any additional claims without canceling a corresponding number of claims; and (d) place the application in better form for appeal, should an appeal be necessary. Entry of this Amendment is thus respectfully requested.

Claims 1, 3-12 and 14 were rejected under 35 U.S.C. §103(a) based on Gelernt (U.S. Pat. No. 6,369,398) in view of Kleinschmidt *et al.* (U.S. Pat. No. 6,160,83) (hereinafter "Kleinschmidt"). The rejection is respectfully traversed.

As a preliminary matter, per MPEP §707.07(d), Applicant notes that a plurality of claims should never be grouped together in a common rejection, unless that rejection is equally applicable to all claims in the group. As this application contains 2 independent claims and 13 dependent claims directed to <u>different</u> embodiments of the invention, Applicant points out that the rejection in the Office Action is not equally applicable to all claims in the group. Therefore, the Office Action is not complete as to all matters because the Examiner has not clearly identified a ground of rejection for <u>each</u> rejected claim. Accordingly, Applicant respectfully requests that the finality of the Office Action be withdrawn.

Furthermore, in the event the rejection of some or all of the pending claims is maintained, the Examiner is respectfully requested to provide in the next communication <u>specific reasons</u> as to why each rejected claim is not patentable over the cited art. If, for example, the current rejections are maintained, Applicant respectfully submits that claims 4 and 7-10 are in condition for allowance since no specific grounds for rejection have been provided.

Furthermore, Applicant notes that claim 13 has not been rejected under 35 U.S.C. §103(a) based on Gelernt in view of Kleinschmidt. Accordingly, Applicant respectfully submits that claim 14 is also patentable over any combinations of Gelernt and Kleinschmidt at least by virtue of its dependency from claim 13. Therefore, Applicant respectfully requests that the rejection of claim 14 under 35 U.S.C. §103(a) based on Gelernt in view of Kleinschmidt be withdrawn.

Claim 1 recites a lithographic projection apparatus comprising, *inter alia*, an acoustic sensor constructed and arranged to detect sounds caused by the passage of pulses of radiation of the projection beam, and a controller in communication with the acoustic sensor and responsive to an output signal of the acoustic sensor, wherein the controller is configured to calculate a radiation energy per unit area at substrate level and to control the radiation energy per unit area delivered by the projection beam of radiation to the substrate, in response to the output signal of the acoustic sensor.

As conceded by the Examiner, Gelernt fails to teach or suggest the use of an acoustic sensor and control of light intensity. However, Applicant respectfully submits that there are additional features that are absent in Gelernt. For example, Gelernt fails to teach or suggest a controller in communication with the acoustic sensor and responsive to an output signal of the acoustic sensor. Moreover, Gelernt fails to teach or suggest a controller configured to calculate a radiation energy per unit area at substrate level and to control the radiation energy per unit area delivered by the projection beam of radiation to the substrate, in response to the output signal of the acoustic sensor.

Kleinschmidt fails to remedy the deficiencies of Gelernt. Kleinschmidt merely discloses a wavelength calibration system which is used for determining the absolute wavelength of an Excimer laser or a molecular fluorine laser. Kleinschmidt discloses that such a determination is made within the laser system. The wavelength calibration system of Kleinschmidt uses a galvatron containing an element that photo-absorbs around the wavelength of the laser. However, Kleinschmidt is completely silent about a controller configured to calculate a radiation energy per unit area at substrate level and to control the radiation energy per unit area delivered by the projection beam of radiation to the substrate, in response to the output signal of the acoustic sensor. As such, any reasonable combination of Gelernt and Kleinschmidt cannot result, in any way, in the invention of claim 1.

Claims 3-12 are patentable over Gelernt, Kleinschmidt and any combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Furthermore, Applicant respectfully submits that there is no motivation to combine Gelernt and Kleinschmidt. (*See* MPEP §2143). Gelernt is merely concerned about selecting a wavelength at which the absorption of ultraviolet radiation by molecular oxygen is minimized. According to Gelernt, if lithography is performed at an irradiating wavelength around the selected wavelength, the stringent requirement for high vacuum or an inert gas purge system can be relaxed. Since the absorption spectrum of molecular oxygen is generally known to one of skill in the art, Gelernt selects a wavelength in the VUV range at which the absorption by molecular oxygen is at its minimum. Consequently, Gelernt does not need and would not benefit from an acoustic detection device to select a wavelength of ultraviolet radiation which corresponds to a minimum absorption of molecular oxygen. Therefore, one of ordinary skill in the art would not be motivated to apply Kleinschmidt's teachings to Gelernt.

Furthermore, Applicant respectfully submits that, per MPEP 2145, it is improper to combine references that teach away from their combination. In the present case, Gelerndt teaches that excimer and molecular laser systems, such as ArF and F2 laser systems, have poor transmission performance and, therefore, require advanced gas purge systems to ensure that substantially all the radiation is transmitted. (*See* col. 4, lines 13-20, 23-36, col. 5, lines 19-32, col. 6, lines 34-45). By contrast, Kleinschmidt is merely concerned about providing wavelength calibration capability for excimer and molecular laser systems, which systems, according to Kleinschmidt, "are rapidly becoming the light sources of choice for photolithographic processing of integrated circuit devices (ICs)." (*See* col. 1, lines 20-27 and col. 2, lines 58-67). Therefore, by virtue of specifically teaching that excimer and molecular laser systems are costly systems, provide poor radiation transmission in the presence of oxygen and require complex pumping systems, and given the fact that Gelerndt is concerned with relaxing the vacuum and inert atmosphere requirements (*see* col. 3, lines 17-35), Applicant respectfully submits that Gelerndt teaches away from Kleinschmidt. For at least this reason, one of ordinary skill in the art would clearly not be motivated to combine these two references.

Finally, Applicant respectfully submits that Kleinschmidt does not provide a disclosure that would enable one skilled in the art to modify Gelernt in order to obtain the invention of claim 1. As mentioned previously, Kleinschmidt merely focuses on a calibrating system using a galvatron containing an element that photo-absorbs around the wavelength of the laser. All of the embodiments discussed in Kleinschmidt (*see* FIGS. 1a-b, 4, 7 and 9-10) use this type of detection system and nearly all the disclosure is directed to this detection

system. It is noted that Kleinschmidt discloses in col. 10, lines 60-64 that a photoacoustic detection may be used. However, Kleinschmidt provides no disclosure, nor any teachings, as to how to implement this new type of detection system in the previously disclosed embodiments. Applicant respectfully submits that the use of such a detection system would require substantial modifications of the discussed embodiments, which modifications are not disclosed by Kleinschmidt. Therefore, Applicant respectfully submits that Kleinschmidt's disclosure is not enabling as to the use of an acoustic detection system and therefore cannot be used in a rejection under 35 U.S.C. §§102, 103 to reject the instant claims. Accordingly, any attempt to combine Kleinschmidt with Gelerndt appears to be an improper reconstruction of the present invention in view of Applicant's disclosure. In that respect, the Examiner is respectfully reminded that a basic mandate inherent in 35 U.S.C. §103 is that "a piecemeal reconstruction of prior art patents in the light of appellant's disclosure" shall not be the basis for a holding of obviousness. *In re Kamm and Young*, 452 F.2d 1052, 172, USPQ 298, 301 (CCPA 1972). In addition, although references may be combined to show that a claim is unpatentable, they may not be combined indiscriminately. To determine whether a combination of references is proper, the following criterion is often used: namely, whether the prior art suggests doing what an applicant has done. It is not enough for a valid rejection to view the prior art in retrospect once an applicant's disclosure is known. *In re Skoll*, 523 F.2d 1392, 187 USPQ 481, 484 (CCPA 1975).

Because the prior art does not suggest the proposed combination and because the cited references teach away from their combination, Applicant respectfully submits that one of ordinary skill in the art would not be motivated to combine the cited references. For at least this reason, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 3-12 and 14 under 35 U.S.C. §103(a) based on Gelernt in view of Kleinschmidt are respectfully requested.

Claims 5-10 and 13 were rejected under 35 U.S.C. §103(a) based on Gelernt in view of Kleinschmidt and further in view of Yamaguchi *et al.* (U.S. Pat. No. 5,333,495) (hereinafter "Yamaguchi"). The rejection is respectfully traversed.

Claims 5-10 are patentable over Gelernt, Kleinschmidt and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein. Namely, claims 5-10 are patentable over Gelernt, Kleinschmidt and a combination thereof at least because these claims recite a lithographic projection apparatus comprising, *inter alia*, an acoustic sensor constructed and arranged to detect sounds caused by the passage

of pulses of radiation of the projection beam; and a controller in communication with the acoustic sensor and responsive to an output signal of the acoustic sensor, wherein the controller is configured to calculate a radiation energy per unit area at substrate level and to control the radiation energy per unit area delivered by the projection beam of radiation to the substrate, in response to the output signal of the acoustic sensor.

Yamaguchi fails to remedy the deficiencies of Gelernt and Kleinschmidt. Specifically, Yamaguchi is silent about, *inter alia*, a controller in communication with the acoustic sensor and responsive to an output signal of the acoustic sensor, wherein the controller is configured to calculate a radiation energy per unit area at substrate level and to control the radiation energy per unit area delivered by the projection beam of radiation to the substrate, in response to the output signal of the acoustic sensor. Therefore, any reasonable combination of Gelernt, Kleinschmidt and Yamaguchi cannot result, in any way, in the invention of claims 5-10.

Furthermore, Applicant respectfully submits that there is no motivation to combine Gelernt and Kleinschmidt for at least the same reasons set forth above.

Claim 13 is patentable over Gelernt, Kleinschmidt and a combination thereof for at least the same reasons provided above in connection with claim 1. Namely, claim 13 is patentable over Gelernt, Kleinschmidt and a combination thereof at least because this claim recites an integrated circuit device manufacturing method comprising, *inter alia*, in response to the detecting, calculating a radiation energy per unit area at substrate level and controlling the radiation energy per unit area delivered by the projection beam to the substrate during an exposure of a target portion.

As mentioned previously, Yamaguchi fails to remedy the deficiencies of Gelernt and Kleinschmidt. Therefore, any reasonable combination of Gelernt, Kleinschmidt and Yamaguchi cannot result, in any way, in the invention of claim 13.

Accordingly, reconsideration and withdrawal of the rejection of claims 5-10 and 13 under 35 U.S.C. §103(a) based on Gelernt in view of Kleinschmidt and further in view of Yamaguchi are respectfully requested.

In view of the foregoing, the claims are now in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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